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REMARKS

Election/Restrictions:

11. Applicant confirms that the election of Group I, claims 1-11 without traverse. While claims 12-18 have been withdrawn from further consideration by the Examiner, under 37 CFR 1.142(b), as being drawn to non-elected invention(s), Applicant reserves the right to prosecute these withdrawn claims 12-18 in one or more divisional applications.

Claim Objections:

12. Claims 8-10 have been objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claims. Claims 8 and 9 have been amended to be dependent from claim 6. Claim 10 has been amended to be dependent from claims 1 and 6. These amendments remove the multiple dependency objection and thus, are believed to place these claims in allowable condition. Reconsideration and allowance is respectfully requested.

Claim 11 has been objected to because of a typographical error. Claim 11 has been amended to replace "that" on line 2 with "than". This claim is now believed to be in allowable condition. Reconsideration and allowance is respectfully requested.

Claim Rejections – 35 USC §112:

13. Claims 1-11 have been rejected under 35 USC 112, second paragraph, as being indefinite. Claim 1 has been amended.

The Examiner has stated that in claim 1 there is no basis for the molecular weight of the non-polyacetal polymer. Claim 1 has been amended to remove the reference to the molecular weight of the non-polyacetal polymer. However, Applicants contend that the molecular weight range is not the introduction of new matter. It is more an indication of a useful embodiment rather than a strict limitation. This is shown in the application on page 11, lines 12-24:

The minimum molecular weight of the thermoplastic polymer (1000) is required in order to ensure compatibility, thermal stability and retain mechanical performance via entanglement of the chains, provided that the polymer has a degree of polymerization of at least ten and further provided that the polymer is melt processible (i.e., it flows under pressure) at the temperature at which the polyoxymethylene is melt processed. The maximum molecular weight of the thermoplastic polymer should not be so high that the thermoplastic polymer by itself would not be injection moldable by standard present techniques. The maximum molecular weight (50,000) for a polymer to be used for injection molding processes will vary with each individual, particular

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thermoplastic polymer. However, said maximum molecular weight for use in injection molding processes is readily discernible by those skilled in the art.

As shown by the above excerpt, the application clearly provides that the useful molecular weight of the non-polyacetal polymer will vary with the particular polymer chosen and can be readily discerned by one skilled in the art. Thus, the molecular weights indicated in the originally filed claims are merely indicative of an embodiment.

Further illustration is provided on page 5, lines 9-18 of the application:

The invention provides in one main aspect a polyacetal mixture for processing into a polyacetal article to be acid-etched and plated, the mixture comprising a polyacetal resin blend comprising 97 – 99.9wt% polyacetal and 0.1 – 3wt% of semicrystalline or amorphous thermoplastic non-polyacetal resin of molecular weight 5,000 – 50,000; and acid-soluble particles from the group selected from carbonates, phosphates, sulfates, acetates, silicates of at least one metal from Group II of the periodic table of elements, said acid-soluble particles being present in an amount from 2 to 6% by weight of the polyacetal blend, at least 98% of said acid-soluble particles being in the size range from 0.1 to 5 micrometers. [Emphasis added.]

It is clearly indicated that the molecular weight range of 5,000 to 50,000 pertains to “one main aspect” [emphasis added] of the invention and need not apply to all embodiments of the invention. The molecular weights indicated in the originally filed claims are merely indicative of a particular embodiment.

Claims 8 and 9 have been rejected for lacking antecedent basis for the term “the acid-insoluble particles” when they are dependent on any one of claims 1-5. Claims 8 and 9 have been amended to depend from claim 6 alone making this rejection moot.

Claims 2-7, 10, and 11 have been rejected for being dependent on a rejected claim. In view of the above arguments claim 1 is believed to be in allowable condition. Hence claims 2-7, 10 and 11 are also believed to be in allowable condition.

Claims Rejections – 35 USC §103:

14. Claims 1-5 and 10 have been rejected under 35 USC. 103(a) as being unpatentable over Hattori et al. (US Pat. No. 4,464,435) in view of Flexman (US Pat. No. 5, 318,813). Hattori et al. discloses a polyacetal composition resin composition comprising polyacetal; a carbonate, phosphate, or acetate of a Group II metal; and an additional polymer. With respect to the particle size of the Group II metal salt, Hattori et al. state that:

[T]he average particle size of the salt of a metal belonging to Group II of the Periodic Table is preferably in the range of about 0.1 to about 4.0 microns and particularly in the range of about 0.5 to about 2.0 microns. [Col. 3, lines 21-25; emphasis added]

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The present invention claims the use of acid-soluble particles from the group selected from at least one salt of at least one metal from Group II of the periodic table of elements wherein at least 98% of the acid-soluble particles are in the size range from 0.1 to 5 micrometers. Hattori et al. say nothing about the *distribution* of particle sizes in their metal salts; they merely state an average particle size. That is as long as the average size of the particles falls within the desired range, the size of the particles can vary significantly. There is no indication of how large the largest metal salt particles can be or how small the smallest metal salt particles can be and what proportion of particles may be in each size. Hence, under Hattori a wide variety of distributions could provide average particle sizes for its purpose.

In contrast, in the present invention, it is necessary that the acid-soluble particles have a relatively narrow size distribution such that 98% of the particles have a *size that ranges from 0.1 to 5 micrometers*, not an *average size* of from 0.1 to 5 micrometers with an unknown distribution of large and small particles away from the average (i.e. Hattori).

The presently claimed particle size range is important for obtaining the excellent surface properties of the compositions of the invention. For example, on page 21, lines 26-32 of the present application it is stated that:

For polyacetal formulations with different CaCO_3 size distributions, when increasing the average primary size particle of the filler from 0.7 up to 15 microns, the aspect was negatively impacted with the apparition of intensive pitting on the parts. Best results were obtained with a calcium carbonate having a narrow size distribution and most preferably having a primary size particle of 0.7 micron in average with a top cut at 2 microns which means that 99% of the particle have a size below 2 microns.

Hattori et al. does not disclose the use of group II metal salts having a narrow size distribution, nor do they indicate that the use of metal salts having such a size distribution will lead to compositions having a good surface appearance. In view of the amendment to claim 1, the rejection regarding molecular weight is deemed moot.

For the above stated reasons, it would not be obvious to one of ordinary skill in the art to combine the cited art to obtain the present invention as such combination of Hattori with that of Flexman would not yield claims 1-5 and 10. Hence, these claims are believed to be non-obvious and reconsideration and allowance is respectfully requested.

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15. Claims 6-9 and 11 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hattori et al. (U.S. 4,464,435) in view of Flexman (U.S. 5,318,813) and further in view of Gelorme et al. (U.S. 4,615,763).

Gelorme discloses a method of improving the adhesion between a photosensitive adhesive and a dielectric substrate comprising in part providing a substrate comprising a resinous material and inorganic particulate material and etching a surface of the substrate in such a way that *selectively etches the resinous material, leaving behind the inorganic particulate material* to provide a roughened surface:

The present invention provides a method for roughening the surface of a substrate. The present invention includes providing a substrate which comprises a resinous material and an inorganic particulate material. The substrate is etched by a method which selectively etches the resinous material, thereby providing a roughened surface. The resinous material is removed while inorganic particulate material remains and is left exposed. The surface topography of the surface of the substrate will assume the features such as particle size and shape of the exposed inorganic particulate material. [Col. 1, lines 12-22; emphasis added.]

In contrast, when the compositions of Hattori are treated with acid during etching, the *Group II metal salt* is removed:

[I]f a salt of a metal belonging to Group II of the Period Table is dispersed in the continuous phase of polyacetal, it can easily be decomposed and removed with an acid and the mark remains as a roughened surface. [Col. 2, lines 61-65; emphasis added.]

And in the present invention the acid-soluble Group II metal salt particles are *removed* during etching and the acid-insoluble particles and polyacetal *remain*:

In an acid-etched polyacetal article obtained by acid etching this molded polyacetal article, the acid soluble particles are removed, leaving the acid-insoluble particles individually or as agglomerates believed up to a maximum size of hundreds of nanometers, anchored in the polyacetal blend around open pores left by the removal of the acid insoluble particles. [Page 15, line 31 to page 16, line 2.]

Furthermore, the process of Gelorme differs substantially from that of the present invention by the examples of inorganic particulate materials that include SiO₂ (silica), kaolin, and CaCO₃ (calcium carbonate) [see col. 3, lines 54-61] that may be used interchangeably in the method of Gelorme. This list include materials that would be acid soluble particles of a Group II metal salt (calcium carbonate; see page 14, lines 12-16 of the present application) and acid insoluble particles (silica and kaolin; see page 15, lines 1-4 of the present application) according to the present invention. Clearly the process of Gelorme would be unsuitable for achieving the aims of present invention, in which the particular combination of acid soluble particles of a Group II metal salt and acid insoluble particles leads to a material that, after etching and plating, has an "outstanding surface aesthetic" and good adhesion of the plating material (see page 15, lines 17-26 and page 22, line 3 to page 23, line 7). Not only is

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the process of Gelorme different from that used to plate the polyacetal mixture of the present invention, but they make no disclosure of the use of the combination of acid soluble particles of a Group II metal salt and acid insoluble particles as presently claimed.

Thus, one of skill in the art would have no motivation to combine the disclosure of the significantly different process of Gelorme with the disclosures of Flexman and Hattori to arrive at the present invention.

Furthermore, as described above in reference to the rejections of claims 6-9 and 11 over Hattori in view of Flexman, the disclosure of Hattori does not describe the use of acid soluble particles selected from group II metal salts wherein at least 98% of the particles are in the size range from 0.1 to 5 micrometers. Therefore, one of ordinary skill in the art would be unable to combine the disclosure Hattori with that of Flexman and Gelorme to arrive at claims 6-9 and 11, and these claims are thus believed to be non-obvious.

16. Claims 1, 2, 4, 5, and 10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumura et al. (U.S. 6,211,268) in view of Hattori et al. Matsumura et al. disclose a polyoxymethylene composition comprising polyoxymethylene, an amine-substituted triazine compound, poly(ethylene glycol), steric hinderance [sic] phenol, and a metal compound. The Examiner has stated that Matsumura does not disclose the size of the metal compound utilized to improve thermal stability, and that Hattori discloses a polyacetal comprising metal salts and "teaches that for its composition to exhibit the advantageous heat stability, the particle diameter necessarily ranges from 0.1 to 4.0 microns."

However, as described above in reference to the rejections of claims 1-5 and 10 over Hattori in view of Flexman, the disclosure of Hattori does not describe the use of acid soluble particles selected from group II metal salts wherein at least 98% of the particles are in the size range from 0.1 to 5 micrometers. Furthermore, the use of the particles of the present invention leads to a polyacetal mixture having an improved surface aspect (see page 21, lines 26-32). The disclosure of Hattori (which emphasizes heat stability) makes no mention of the use of acid soluble particles selected from group II metal salts having the particle size of the present invention in the preparing of a polyacetal mixture having an improved surface aspect. Therefore, one of ordinary skill in the art would be unable to combine the disclosure of Matsumura with that of Hattori to arrive at claims 1, 2, 4, 5, and 10 and these claims are thus believed to be non-obvious. Reconsideration and allowance of the claims is respectfully requested.

No additional fees are believed due for consideration of this response. However, should a petition under 37 CFR § 1.136 for extension of time or any other fee be required for consideration of this response, please charge the fee to Deposit Account No. 04-1928 (E. I. du Pont de Nemours and Company.)

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In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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